

## Dependence of Thermophysical Properties of n-Alkanes on Carbon Number in Molecule

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It is a well-known fact, that the melting temperature  $T_m$  of n-alkanes increases serrately with the growth of the carbon number  $n_c$  in the molecule. It is more evident at  $n_c < 10$ . It is interesting to examine the behaviour of other thermophysical properties. We analyzed the experimental data of viscosity  $\eta$  ( $n_c = 5-17$ ) at temperatures near  $T_m$  and determined  $\eta_m$ . It is observed, that  $\eta_m$  increases with the growth of  $n_c$ . But with an increase of  $n_c$ , the difference in the values of properties decreases. The value of  $\eta$  for even numbers of  $n_c$  is lower than for odd numbers. The dependence of melting heat  $q_m$  on  $n_c = 5-20$  has the same serrated character. However, the values of  $q_m$  for even numbers of  $n_c$  are more than for odd numbers. The difference in the values of  $q_m$  for two adjoining n-alkanes (for example  $n_{12}$  and  $n_{13}$ ) increases up to 50 %.

Thermophysical properties of substances are dependent on their density. The density of liquid n-alkanes near  $T_m$  are investigated in detail. However, the data on the density of solid n-alkanes are very rare (for example, there are only experimental data on density for n-C<sub>16</sub>H<sub>34</sub>). The experimental apparatus for the measurements of n-alkanes density in liquid and solid phases (picnometer method) was developed. The autoclave side-wall was transparent, allowing a view of the crystallization process from the liquid phase. For the full filling of picnometer, the crystallization process was conducted under pressurization by gas. The density of six n-alkanes (n-C<sub>12</sub>H<sub>26</sub>, C<sub>13</sub>H<sub>28</sub>, C<sub>14</sub>H<sub>30</sub>, C<sub>16</sub>H<sub>34</sub>, C<sub>18</sub>H<sub>38</sub>, C<sub>24</sub>H<sub>50</sub>) was measured near  $T_m$  in liquid and solid phases. A small increase of the density with an increase of  $n_c$  for liquid and solid phases was observed. There is no serrated behaviour of density, that takes place for  $n_c < 10$ . Only for n-C<sub>13</sub>H<sub>28</sub>, there was a small increase of density value.